UNIVERSITY OF DELTA, AGBOR, NIGERIA
COMPUTING
COMPUTER SCIENCE
B.Sc. Information and Communication Technology

UNIDEL-ICT 205: Smart Systems (3 Units; Compulsory; LH=45; PH=0)

Senate-approved Relevance
The training of high-skilled graduates who are conversant with the smart systems, their application, enabling technologies and where they can be used in ICT application areas in Delta State and Nigeria in General while identifying and evaluating the impact of smart systems in industry, homes, business, manufacturing and other educational institution within Nigeria is in tandem with the vision and mission of the University of Delta, Agbor. This ensures that Information and Communication Technology graduates with demonstrable potentials and necessary skillset to attend to trending issues in smart systems and smart society. The relevance of this is seeing and producing ICT graduates of the University of Delta, Agbor being versed in smart systems, other enabling technologies and emerging trends such as Internet of Things, Artificial Intelligence, Cyber physical systems. The students would be armed with relevant skills to also analyze and identify impact and challenges of using smart systems and cyber physical systems as well as security of data and systems in order to appropriately respond and manage ICT related activities within the context of global, multinational sociocultural, interreligious and legal perspective with emphasis on Nigeria.

Overview
As humans we can sense, act, speak, listen, decide and sometimes understand. The 21st century will witness technologies that can do the same. We will see cars that negotiate with each other in order to optimize traffic flow. Our T-shirts may have their own Internet addresses and tell the manufacturer if they are only rarely worn. Smart Systems are the next generation of computing and information systems that use a number of enabling technologies to provide real-time networked information. The term 'Smart' has given rise to a number of areas of application and students are expected to gain knowledge of these areas such as Artificial Intelligence, Pervasive Computing, Cyber Physical systems, Internet of Things and to be able to define Smart systems and demonstrate an understanding of their purpose, their background, and evolution.

This course explores smarts systems, issues, obstacles and solutions on its implementation and its related activities in Delta State, Nigeria, and the world as well as the impact towards Nigeria society and the world. Both positive and negative impacts on smart system implementation is examined and discussed. Most recent issues are open for discussion. This will ensure that students are updated with the current issues related to smart systems.

Objectives
The objectives of this course are to: (i) Define and explain the purpose of smart systems (ii) Describe and explain the principles and fundamentals of Artificial Intelligence (AI). (iii) Define and explain the role of Pervasive Computing. (iv) Explain the Internet of Things (IoT). (v) Describe and explain the purpose of Cyber Physical Systems (CPS) (vi) Define and describe the

purpose of Big Data (BD), Data Analytics (DA) and Data Mining (DM) (vii) identify and evaluate any challenges with regard to this technology

Learning Outcomes

Upon completion of this course, students should be able to: (i) explain and discuss mart Systems, their implementation and applications. (ii) discuss the basic knowledge of AI, its background, current, future and potential use, and be able to discuss its role, purpose and contribution to Smart Systems. (iii) Define and explain the role of Pervasive Computing in smart systems.(iv) Describe and explain the purpose of Cyber Physical Systems (CPS) (v) Explain the Internet of Things (IoT) and how it supports smart systems (v) Define and describe the purpose of Big Data (BD), Data Analytics (DA) and Data Mining (DM) (vi) to identify and evaluate any challenges with regard to this technology(vii) define and explain the purpose of CPSs as well as identify and discuss examples of cyber security challenges instigated by their use in Smart Systems. (viii) Interpret and explain the impact of Smart Systems, ethical, legal, social, environmental implications. (ix) Discuss examples of Smart Systems used in real life situations (x)explain the major Smart Systems application areas and techniques used within them.

Course Content

The background and historical perspective of the Smart Systems domain. Smart Services. Smart Industry. Smart Manufacturing. Historical background of AI. principles and fundamentals of AI. Knowledge of the characteristics of AI. Different levels of AI. Aspects of human intelligence used to characterize intelligent knowledge-based systems. Potential of AI. Advantages and disadvantages of AI. Key principles of Pervasive Computing and its purpose. Advantages of pervasive computing. Knowledge of its features, connectivity, productivity etc. Pervasive Computing and its application. Definition and explanation of the nature of Cyber Physical Systems. Purpose of Cyber security with respect to these systems. Security challenges Classification of the areas of security in CPSs. Definition and purpose of IoT. Its role and applications in Smart Systems. Advantages and disadvantages of IoT. Purpose of Big Data. Data Analytics and Data Mining and their application. Application of Smart Systems.

Minimum Academic Standard

NUC minimum academic standard requirements for facilities.